

TB(1B) Ch. 10 Introduction to Coordinates Conventional Questions

1. [11-12 Standardized Test 2 Q3]

In **Figure 2**, $A(-3, 5)$, $B(-8, -2)$, $C(-8, -5)$ and $D(6, -2)$ are the vertices of a quadrilateral. BD cuts the y -axis at P .

- (a) Write down the coordinates of P . (1 mark)
- (b) Find the area of quadrilateral $ABCD$. (3 marks)

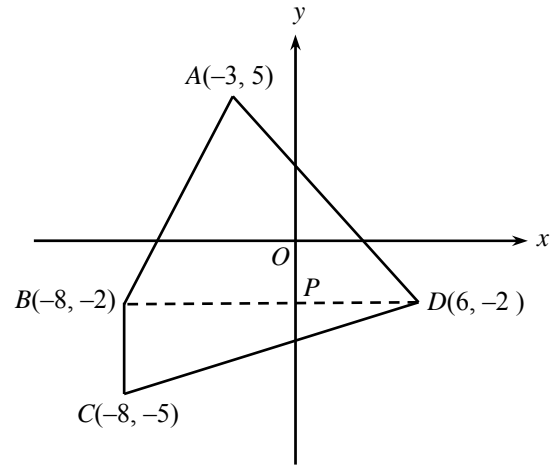


Figure 2

2. [11-12 Standardized Test 2 Q6]

Figure 5 shows $\triangle ABC$, draw and label its image $\triangle A'B'C'$ after reflecting it about L . Write down the coordinates of points A' , B' and C' beside them. (3 marks)

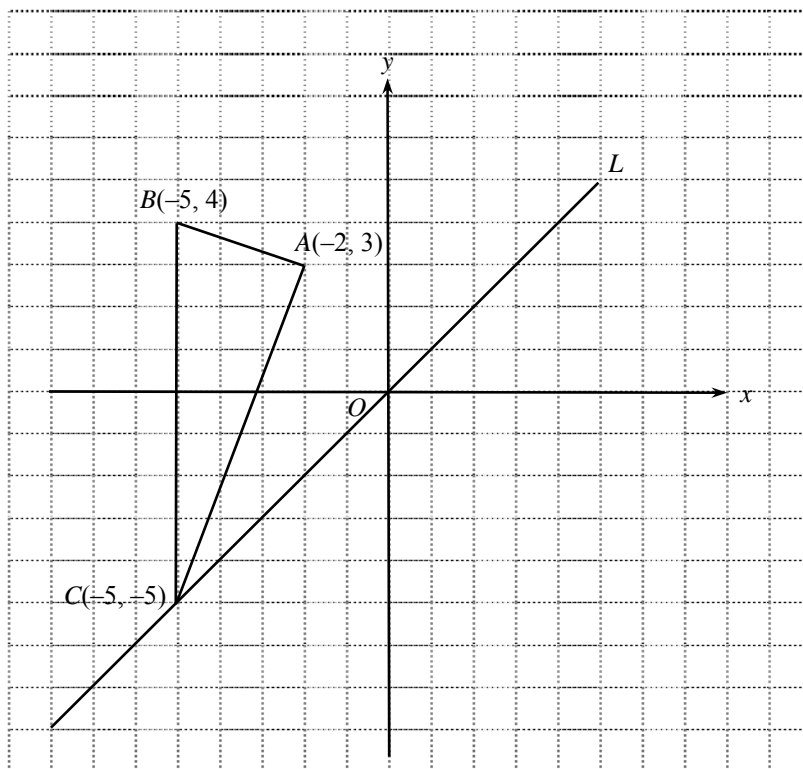


Figure 5

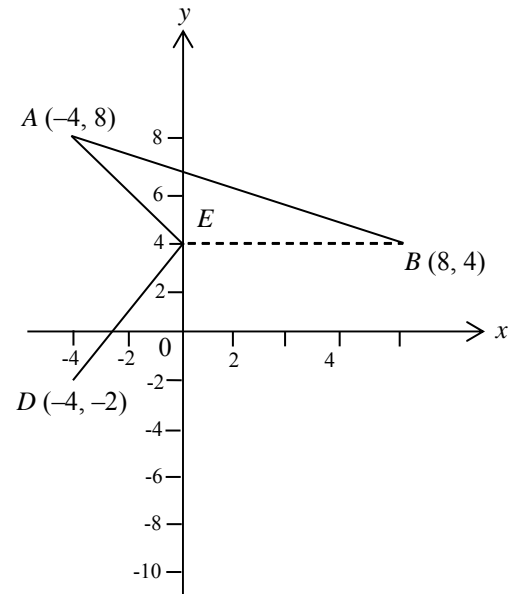
3. [11-12 Standardized Test 2 Q7]

It is given that $P(y + 5, 2)$ is rotated clockwise about the origin through 270° to $Q(x - 4, 3)$. Find the values of x and y . (2marks)

4. [11-12 Final Exam Q11]

In **Figure 5**, $A(-4, 8)$, $B(8, 4)$, C , $D(-4, -2)$ and E are the vertices of pentagon $ABCDE$.

- (a) Write down the coordinates of E . (1 mark)
- (b) Find the area of $\triangle ABE$. (2 marks)
- (c) (i) B is rotated clockwise about the origin through 90° to C . Write down the coordinates of C . (1 mark)
- (ii) Plot C in the figure. Join BC and CD . Find the area of pentagon $ABCDE$. (3 marks)



5. [12-13 Standardized Test 2 Q4]

Figure 2 shows $\triangle ABC$ with vertices $A(1, 2)$, $B(-1, -1)$ and $C(-4, -1)$. Find the area of $\triangle ABC$.

Figure 2
(3 marks)

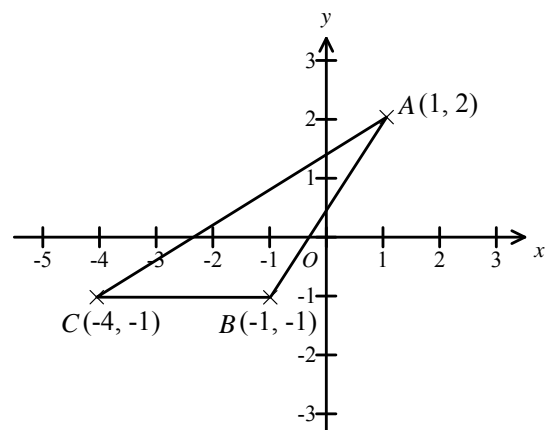


Figure 2

6. [12-13 Standardized Test 2 Q8]

Line L is parallel to the y -axis and it passes through $(2, 0)$. If $P(x + 2, 3)$ is rotated about the origin O through 180° and then reflected about L to $Q(2x, y)$, find the values of x and y .

(3 marks)

7. [12-13 Final Exam Q3]

$A(2, 90^\circ)$, $B(2, 235^\circ)$ and $C(5, 270^\circ)$ are 3 points on a polar coordinate plane.

- (a) Write down the length of AC . (1 mark)
- (b) Find $\angle AOB$. (2 marks)

8. [12-13 Final Exam Q10]

$A(2, k + 2)$, $B(2, k - 3)$ and $C(c, k - 3)$ are three vertices of square $ABCD$ in the rectangular coordinate plane, where k is a constant. Find

- (a) the area of square $ABCD$; (2 marks)
- (b) all possible values of c . (2 marks)

9. [13-14 Final Exam Q9]

In **Figure 5**, $ABCD$ is a parallelogram such that $AB = CD$ and $AD = BC$.

- (a) Find the coordinates of B . (2 marks)
- (b) Find the area of parallelogram $ABCD$. (2 marks)
- (c) L is a line parallel to the y -axis. It intersects the x -axis at $(k, 0)$. B is reflected about L to B' such that $AB' = CD$.

Write down a possible value of k . (1 mark)

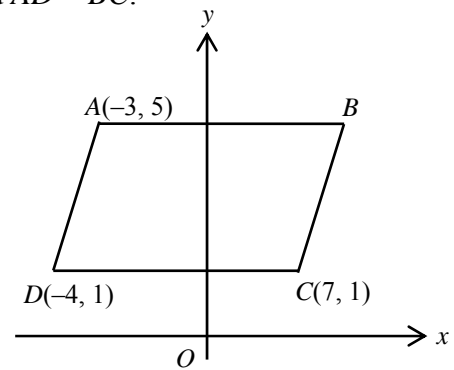


Figure 5

10. [13-14 Final Exam Q12]

$A(-1, 8)$, $B(-1, 2)$ and $C(m + 2, n)$ form a right-angled triangle where $AB \perp BC$ and $m < -3$. C is rotated clockwise about the origin O through 90° to D .

- (a) Find the coordinates of D in terms of m . (2 marks)
- (b) If the area of $\triangle ABD$ is half of the area of $\triangle ABC$, find the coordinates of C . (3 marks)

11. [14-15 Standardized Test Q3]

Refer to **Figure 1**.

- (a) Write down the polar coordinates of point P . (1 mark)
- (b) $Q(5, 40^\circ)$ is a point on the polar coordinate plane.
 - (i) Find $\angle POQ$. (1 mark)
 - (ii) Find the area of $\triangle POQ$. (1 mark)

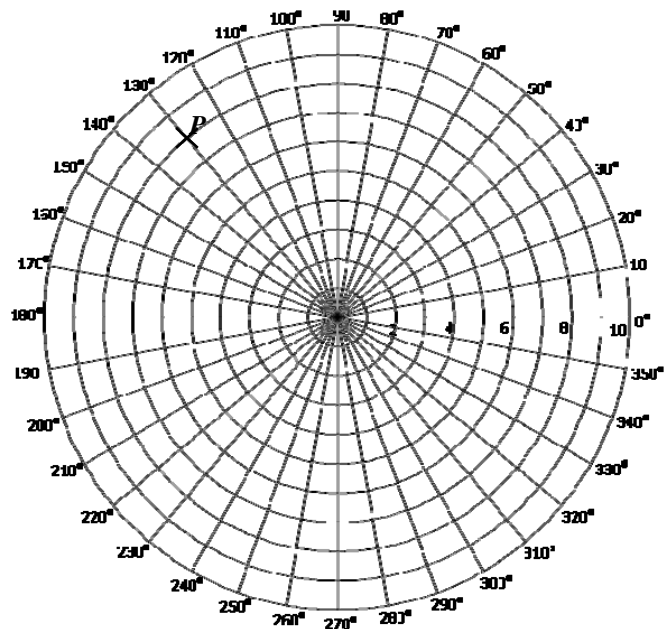
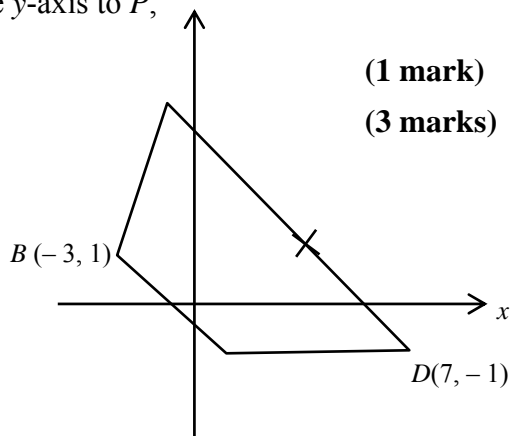


Figure 1

12. [14-15 Standardized Test Q6]

In **Figure 3**, $A(-1, 3)$, $B(-3, 1)$, $C(1, -1)$ and $D(7, -1)$ form a quadrilateral on a rectangular coordinate plane. If $BC \parallel AD$ and B is reflected about the y -axis to P ,

- (a) write down the coordinates of P .
- (b) find the area of the quadrilateral $ABCD$.



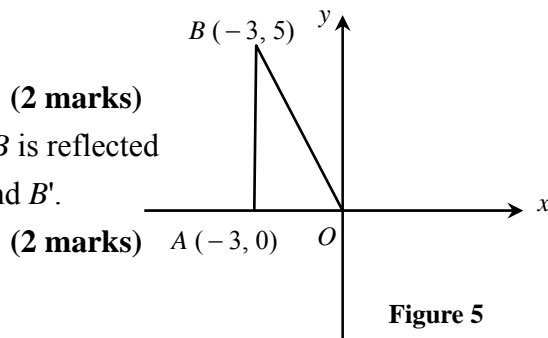
(1 mark)

(3 marks)

13. [14-15 Final Exam Q10]

In **Figure 5**, $A(-3, 0)$ and $B(-3, 5)$ are two points on a coordinate plane. It is given that A is rotated anti-clockwise through 270° about the origin to A' , and B is reflected about the x -axis to B' .

- (a) Write down the coordinates of A' and B' .
- (b) L is a line parallel to x -axis and passes through A' . If B is reflected about the line L to B'' , find the distance between B'' and B' .



(2 marks)

(2 marks)

Figure 5

14. [14-15 Final Exam Q12]

In **Figure 6(a)**, $AOBC$ is a square. D is a point on AC and E is a point on CB produced such that $\angle DOE = 90^\circ$. Let $\angle AOD = a$.

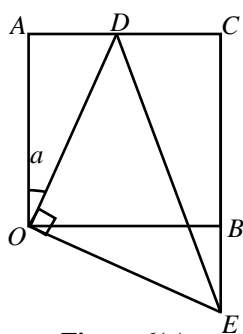


Figure 6(a)

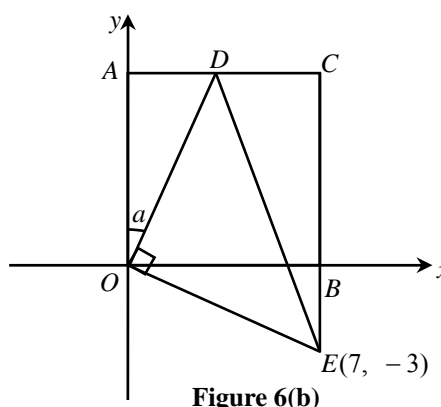


Figure 6(b)

- (a) Prove that $\triangle DAO \cong \triangle EBO$.
- (b) A rectangular coordinate system is introduced to **Figure 6(a)** such that O is the origin and the coordinates of E are $(7, -3)$ as shown in **Figure 6(b)**. Find the area of $\triangle DOE$.

(3 marks)

(2 marks)

15. [15-16 Final Exam, #7]

Figure 3 shows a rectangular coordinate plane. Three points $A(-4, 4)$, $B(4, -2)$ and $C(2, 4)$ form $\triangle ABC$.

- (a) Find the area of $\triangle ABC$. **(2 marks)**
- (b) Suppose point B is translated to the right by 16 units to B' .
 - (i) Find the coordinates of B' . **(1 mark)**
 - (ii) Find the area of $\triangle AB'C$. **(1 mark)**

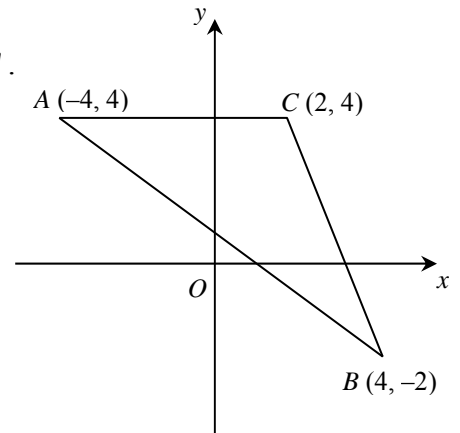


Figure 3

16. [15-16 Final Exam, #12]

Figure 7(a) is formed by four identical right-angled triangles.

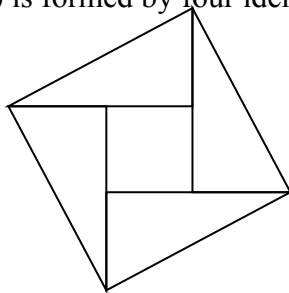


Figure 7(a)

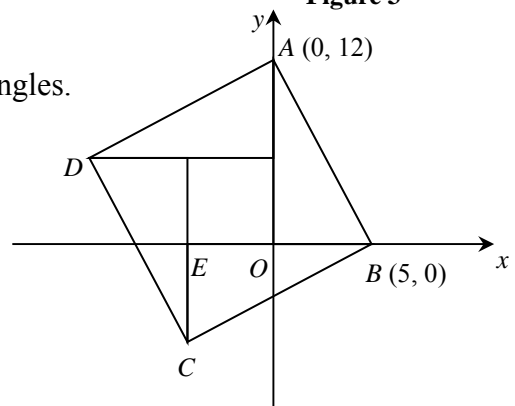


Figure 7(b)

- (a) Write down the number of axes of reflectional symmetry and the order of rotational symmetry of Figure 7(a) in the table below. **(1 mark)**

Number of axes of reflectional symmetry	
Order of rotational symmetry	

- (b) A rectangular coordinate plane with O as the origin, B introduced to Figure 7(a) so that the coordinates of A and B are $(0, 12)$ and $(5, 0)$ respectively. (see Figure 7(b))
 - (i) Write down the coordinates of E . **(1 mark)**
 - (ii) Find the length of AB . **(2 marks)**

17. [15-16 Standardized Test, #4]

In the polar coordinate system, O is the pole. The polar coordinates of the points A , B and C are $(2, 83^\circ)$, $(3, 173^\circ)$ and $(4, 353^\circ)$ respectively.

- (a) Find $\angle AOB$. **(1 mark)**
- (b) Find the area of $\triangle ABC$. **(2 marks)**

18. [15-16 Standardized Test, #7]

In **Figure 6**, the coordinates of A and B are $(-1, 8)$ and $(-5, -4)$ respectively. A is reflected about line L , and then translated downwards by 6 units to point C .

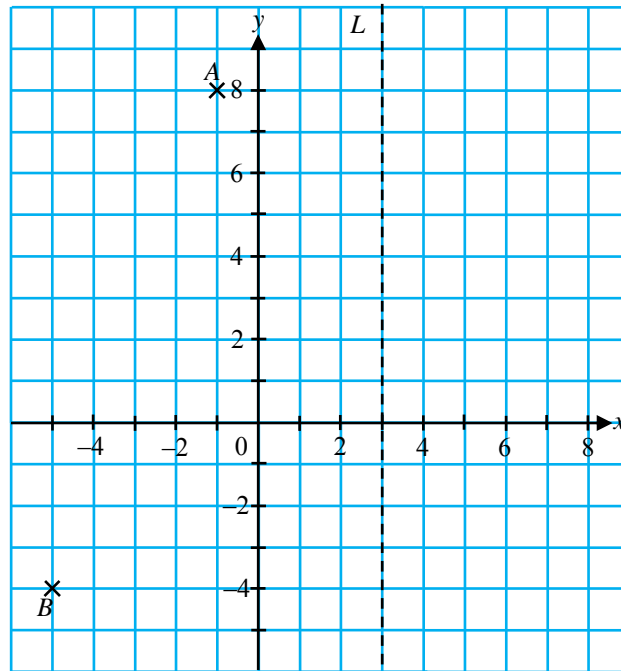


Figure 6

- (a) Write down the coordinates of C . (1 mark)
- (b) Find the area of $\triangle ABC$. (2 marks)
- (c) If $\triangle ABC$ is reduced by a scale factor of 0.5, find the area of the image. (1 mark)

~ End ~